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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/657,436	09/08/2003	Ram W. Sabnis	30545-CNT4	1448

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EXAMINER

ANGEBRANDT, MARTIN J

ART UNIT	PAPER NUMBER
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1756

DATE MAILED: 05/05/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/657,436

Applicant(s)

SABNIS ET AL.

Examiner

Martin J Angebranndt

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 29 September 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 39-63 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 39-63 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 29 September 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>9/29/03</u> . | 6) <input type="checkbox"/> Other: _____ |

1. The response provided by the applicant has been read and given careful consideration. The amendment reciting the presence of a photopolymerizable binder obviates the rejections under 35 U.S.C. 112, second paragraph. Responses to the comments and arguments of the applicant appear after the first rejection to which they are directed.

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3 Claims 39-48 and 50-63 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hatai JP 08-034923, in view of Nakamura JP 08-036257, Nakamura et al. EP 0740183, Koyanagi et al. JP 09-054431, JP 55-117142 and JP 02-173602.

Hatai JP 08-034923 (with machine translation) teaches a photosensitive resin which includes a polymeric polymer (A), a surfactant, a coloring pigment (D) and a black dye (E). This is coated on a transparent substrate, exposed through a photomask and developed. Useful dyes are disclosed in section [0021] and include metallized dyes, chrome black P2B and chrome black T (which are azo dyes which are mordanted with chrome). The other dyes disclosed in section 0034] also appear to be azo dyes. These may be used in amounts of 1-20% to obtain the desired amount of light blocking/shielding [0022]. Useful pigments, including titanium oxide and various other oxides, which can be used in amounts relative to the weight of the polymeric binder of 1:0.2-1:10 are disclosed and the use of carbon black is discouraged. [0019-0020] Example 1 use

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PC black 205D as the black dye and Fastogen Blue TGR and Fastogen Super Violet RVS as the (organic) pigments. Polyoxyethylene alkyl phenyl is a crosslinkable/polymerizable polymer and inherently acts as a binder and 2-hydroxyethyl methacrylate is the photosensitive monomer and p-diazo diphenylamine is the photoinitiator and a film of 0.8 microns has a transmittance of 1.5%. It is not clear what the chemical composition/structure of PC black 205D is. The photosensitive polymer may be polyvinyl alcohol, polyvinyl pyrrolidone, polymers of acrylic acid, methacrylic acid, ...polyacrylamide [0010]. These are also dyeable [0014]. Example 2 initially has a transmittance of 4% for a 0.8 microns coating and with dying this is reduced 0.5%.

Nakamura JP 08-036257 (with machine translation) teaches the use of silica coated pigments because they are cheaper. (section [0005]) The coatings resulting from the compositions have a resistivity of 10^{10} to 10^{13} ohm/cm² and a transmission of 1-2% for coating thicknesses of 0.4-0.8 microns. [section 0026] Useful black pigments are disclosed in sections 0005 and described as useful in amounts of 5-30 wt %. Useful black pigments are disclosed in sections 0006-0008 and described as useful in amounts of 2-30 wt % and 5-15 wt % respectively. Useful components for the photosensitive resins, including acrylic monomers are disclosed in sections 0010 through 0011.

Nakamura et al. EP 0740183 teaches the use of black spinel pigments, such as CI Pigment black 26 made in synthesis example 1. (page 9) The use of silanes to produce silica coated pigments is disclosed on page 6/lines 1-18.

Koyanagi et al. JP 09-054431 teaches compositions which include titanium black which has been treated with a silane. Useful silanes, including trialkoxy silanes, are described in section [0014] These compositions are photosensitive and containing photo initiating agents,

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monomers and a binder. Other colorants may be added as discussed with respect to the fourth and fifth columns of table 1. Tables 2 shows that samples 3-15 and 17. This dispersion is coated from solution to form a black hardened film. The language describing the solvent soluble organic dye at levels less than 3% is held to embrace no dye being present. The examiner holds that as the silane treatment is applied to the pigment, a silica coating is formed on the pigment as well. Useful pigments are disclosed in section [0016] and include metallized colorants.

JP 55-117142 teaches photoimageable sheets having a high optical density, where the combination of optical density from carbon black and solvent black 28 (a chromium chelated azo dye) yield the desired optical density of at least 3.0. The monomer is trimethylolpropane triacrylate. (abstract).

JP 02-173602 teaches the use of solvent black 29 (Oleosol Fast Black RL, a chromium chelated azo dye) in forming black matrices. The use of UV hardenable compositions which contain silane coupling agents and acetophenone photoinitiator systems is disclosed. The monomer is trimethylolpropane triacrylate.

It would have been obvious to one skilled in the art to one skilled in the art to modify Hatai JP 08-034923 by using other oxide pigments known in the art as being useful in forming black light shielding barriers for color filters, CRT or the like, such as those disclosed by Nakamura JP 08-036257, Nakamura et al. EP 0740183 or Koyanagi et al. JP 09-054431 and to specifically use the silica coated pigments as they are cheaper as disclosed by Nakamura JP 08-036257 and to use various silanes to form the coatings such as those taught by Nakamura et al. EP 0740183 and Koyanagi et al. JP 09-054431 based upon their disclosure of the use of these silanes as a means to produce the desired silica coatings on pigments and to use compounds,

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such as the solvent black dyes taught by JP 55-117142 and/or JP 02-173602 in place of similar compounds within the same classes as those used in the examples and disclosed as useful by Hatai JP 08-034923 in amounts to achieve an optical density of more than 3.0 for a 1 microns thickness with a reasonable expectation of obtaining comparable results.

Further, the examiner holds that it would have been obvious to use coupling agents, such as those disclosed by JP 02-173602 to increase the adhesion of the resultant compositions and/or multifunctional monomers to enable crosslinking of the reactive polyme and the use various silanes to form the coatings such as those taught by Nakamura et al. EP 0740183 and Koyanagi et al. JP 09-054431.

The examiner notes that the prior art attempts described in the instant application do not refer to Hatai JP 08-034923, which is considered the closest prior art. The argued higher stability may provide a basis for patentability, but the stability likely depends more on the photosensitive materials used, than the other components. Data from the applicant comparing the stability of the inventive compositions to those of Hatai JP 08-034923 would be welcome together with any necessary amendments to the claims to make them commensurate with the evidenciary showing. The examiner notes that the effects of replacing carbon black with other pigments, such as those disclosed by Nakamura JP 08-036257, Nakamura et al. EP 0740183 or Koyanagi et al. JP 09-054431 are known to include higher resistivity and reduced cost, while paying the price of reduced opacity. The cure for this loss in opacity is taught in JP 55-117142 and JP 02-173602, where the addition of dyes to increase the opacity of the black matrix is disclosed.

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4 Claims 39-63 are rejected under 35 U.S.C. 103(a) as being unpatentable over Claims 39-48 and 50-63 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hatai JP 08-034923, in view of Nakamura JP 08-036257, Nakamura et al. EP 0740183, Koyanagi et al. JP 09-054431, JP 55-117142 and JP 02-173602, further in view of Buazza et al. '462.

Buazza et al. '462 teach the use of various photoinitiators including thioxanthenes, acetophenones, such as Irgacure 369, together with coinitiators, such as octyl-p-dimethylamino benzoate. (68/11-69/42).

In addition to the basis above, it would have been obvious to use combinations of known photoinitiators and co-initiators to cure optically dense radiation curable compositions such as those taught by Buazza et al. '462 to cure the photosensitive resins resulting from the combination of Hatai JP 08-034923, in view of Nakamura JP 08-036257, Nakamura et al. EP 0740183, Koyanagi et al. JP 09-054431, JP 55-117142 and JP 02-173602.

5 Claims 39-48 and 50-63 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hatai JP 08-034923, in view of **either of** Sabnis et al. WO 98/13728 **or** Sabnis et al. WO 98/13728 **combined with** JP 55-117142.

Sabnis et al. WO 98/13728 teaches organic matrices with high optical densities (greater than 2.0) at thicknesses of less than 1 micron with high resistivities. The metal oxide pigments obviate the need for a low resistivity carbon black. The dyes, including Solvent Black 35, Solvent Black 27, Solvent Black 3, Solvent Black 5, Solvent Black 7, Solvent Black 46, Solvent Black 28, Solvent Black 29, Solvent Black 45 (page 10). The pigments include pigment black 26 with particle sizes of less than 50 nm (0.050 microns). (pages 11 and 12). The shelf life is

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excellent (page 14). Example 1 has a resistivity of 5.6×10^{11} ohm/cm² and an OD of 2.4 apparently without using a dye. (page 15).

Sabnis et al. '201 teaches organic matrices with high optical densities (greater than 2.0) at thicknesses of less than 1 micron with high resistivities. The metal oxide pigments obviate the need for a low resistivity carbon black. The dyes, including Solvent Black 35, Solvent Black 27, Solvent Black 3, Solvent Black 5, Solvent Black 7, Solvent Black 46, Solvent Black 28, Solvent Black 29, Solvent Black 45 (5/21-31). The pigments include pigment black 26 with particle sizes of less than 50 nm (0.050 microns). (5/55-6/6). The shelf life is excellent (6/61-7/4). Example 1 has a resistivity of 5.6×10^{11} ohm/cm² and an OD of 2.4 apparently without using a dye. (7/5-54).

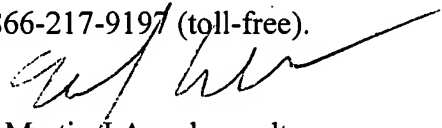
It would have been obvious to one skilled in the art to modify the invention of Hatai JP 08-03492 by using the pigment and dye colorant mixtures disclosed by Sabnis et al. WO 98/13728 or Sabnis et al. WO 98/13728 to allow high optical densities and resistivities to be realized without the use of carbon black. This is congruent to the teaching away from carbon black by Hatai JP 08-03492 and further to use sufficient colorant to achieve optical densities of more than 3 OD based upon the direction within JP 55-117142, which is congruent with the teachings of greater than 2 OD by Sabnis et al. WO 98/13728 and Sabnis et al. WO 98/13728.

6 Any inquiry concerning this communication or earlier communications from the examiner should be directed to Martin J Angebrannt whose telephone number is 571-272-1378. The examiner can normally be reached on Monday-Thursday and alternate Fridays.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mark Huff can be reached on 571-272-1385. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Martin J Angebrannndt
Primary Examiner
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05/03/2004